

REMARKS

Claims 1-14 are pending in this application. Claims 1 and 14 are independent claims.

By this amendment, the "Title", "Summary of the Invention", and the "Abstract" are amended.

Reconsideration in view of the above amendments and following remarks is respectfully solicited.

Allowable Subject Matter

Applicants gratefully acknowledge the Examiner's indication of allowable subject matter in dependent claims 2-13 over the art of record. The Office Action also indicates that claims 2-13 are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, applicants respectfully submit that all of claims 1-14 are allowable, for at least the reasons set forth below.

Objections to the Disclosure

As for the objection to the "Summary of the Invention", applicants submit that the attached amendments should be sufficient to obviate the objections thereto.

Accordingly, withdrawal of the objection to the "Summary of the Invention" is respectfully requested.

As for the objection to the "Title", applicants respectfully submit that the amendment to the Title should be sufficient to obviate the objection thereto.

Accordingly, withdrawal of the objection to the "Title" is respectfully requested.

As for the objection to the Abstract, applicants respectfully submit that the substitute "Abstract" should be sufficient to overcome the Examiner objections.

Accordingly, withdrawal of the objection to the "Abstract" is respectfully requested.

The Claims Define Patentable Subject Matter

The Office Action makes the following rejection:

Independent claims 1 and 14 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,617,016 to Borghi et al. (hereafter Borghi).

This rejection is respectfully traversed.

Applicants respectfully submit that the claimed invention is distinguishable from the cited art, Borghi, for at least the following reasons:

The Examiner alleges that Borghi discloses an OFF drive control means (CLOCK and DIVIDER) for causing the OFF drive circuit to begin operating at the same time as an OFF period of the switching element begins, and for causing the OFF drive circuit to stop operating before the OFF period of the switching element ends. (see Office Action, page 5). Applicants respectfully disagree with this allegation.

For example, applicants submit that Borghi fails to disclose means for causing the OFF drive circuit to begin operating at the same time the OFF period of the switching

element begins and stop operating before the OFF period of the switching element ends. In contrast with the present invention, Borghi merely discloses that the period of time during which the OUT CMS signal maintains the power switch M in an OFF condition ...is monitored by the T_{OFF}Control block. (see Borghi, col. 5, lines 45-50).

In other words, Borghi merely discloses that it monitors the period of time during which the power switch M is in the OFF condition. However, Borghi fails to disclose that the OFF drive circuit stops operating before the drive control signal becomes active. Borghi is completely silent about an OFF drive circuit that stops prior to the drive control signal becoming active. In fact, it appears that Borghi teaches/suggests that the OFF drive circuit continues to operate during the entire inactive period of the drive control signal. (see Borghi, Fig. 4). In any case, Borghi simply fails to teach or suggest stopping the OFF drive circuit before the drive control signal becomes active again.

In the present invention, by stopping the operation of the OFF drive circuit before (prior to) the drive control signal becoming active (i.e., before the OFF period of the switching element ends) allows reduced power consumption.

Furthermore, the OFF drive control circuit of claims 1, 14 in accordance with the present invention causes the OFF drive circuit to begin operating at the same time as the OFF period of the switching element begins, for example, by shortening the pulse width of the pulse signal (OFF drive control signal) by which the control circuit instructs the OFF drive circuit to

operate, and causes the OFF drive circuit to stop operating before the OFF period of the switching element ends.

In the foregoing arrangement, the OFF drive circuit operates at the same time as the OFF period of the switching element begins, so that it is possible to turn OFF the switching element without any trouble.

Further, in the present invention, the OFF drive circuit stops operating before the OFF period of the switching element ends, so that it is possible to reduce an average value of the OFF drive current and to reduce power consumption compared with a case where the OFF drive circuit continues to operate during the OFF period and generate the OFF drive current. Note that while the OFF drive circuit stops operating, the OFF drive current is not generated, but the switching element has already been shut down while the OFF drive circuit has been operating, so that it is possible to continue to shut down the switching element without any trouble during the rest of the OFF period, that is, until the ON drive circuit begins operating again.

As a result, it is possible to realize a switching power supply circuit whose power supply conversion efficiency is high compared with an arrangement in which the OFF drive circuit continues to operate during the OFF period of the switching element. (See the specification, page 6, line 10 to page 7, line 13).

The Examiner cites Borghi, col. 5, lines 45-64. The Examiner alleges that RIFFER causes the output of T_{OFF} Control to be off/stop-operating before the end of the OFF period/cycle.

However, in column 5, Borghi merely discloses that: the cycle is monitored by a T_{OFF} control block while maintaining the

power switch M with the OUT CMS signal off, RIFFER is used by the T_{OFF} Control block; and if the time interval T_{OFF} has dropped to or below a predetermined preset limit, the T_{OFF} Control block produces a reset signal for the MODE LATCH 540.

As such, Borghi fails to disclose an arrangement having OFF drive control means causing the OFF drive circuit to begin operating at the same time as the OFF period of the switching element begins and causes the OFF drive circuit to stop operating before the OFF period of the switching element ends.

For at least the above noted reasons, applicants submit that the present invention is distinguishable from Borghi and Borghi fails to clearly anticipate the claimed invention.

According to MPEP §2131, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ...claims." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913 (Fed. Cir. 1989). The elements must be arranged as required by the claims, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicants respectfully submit that the Office Action has failed to establish the required *prima facie* case of anticipation because the cited reference, Borghi, fails to teach

or suggest each and every feature as set forth in the claimed invention.

Applicants respectfully submit that independent claims 1 and 14 are allowable over Borghi for at least the reasons noted above.

Accordingly, withdrawal of the rejection of claims 1 and 14 under 35 U.S.C. §102(b) is respectfully solicited.

Conclusion


In view of the foregoing, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Carolyn T. Baumgardner (Reg. No. 41,345) at (703) 205-8000 to schedule a Personal Interview.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment from or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §1.16 or under 37 C.F.R. §1.17; particularly, the extension of time fees.

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Respectfully submitted,


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Attachment: Abstract of the Disclosure